MISSOURI HOUSE OF REPRESENTATIVES

COMMITTEE ON ENERGY AND ENVIRONMENT

INVESTIGATIVE REPORT ON GAS PIPELINE EXPLOSIONS

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Prepared by
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House Research, April 10, 1989
Missouri House of Representatives

Committee on Energy and Environment

Investigative Report on Gas Pipeline Explosions

On February 23, 1989, the Honorable Bob F. Griffin, Speaker of the House of Representatives, directed the Energy and Environment Committee to investigate a series of explosions linked directly to gas pipeline leaks. Specifically, the committee was asked to address the following questions within the context of their investigation:

1. Do deficiencies exist in state law that promote lax enforcement or ambiguous rules and regulations pertaining to gas pipelines and the Public Service Commission (PSC);

2. Is the PSC requiring utilities to act properly as required by the Pipeline Safety act;

3. Does the PSC have sufficient authority to require additional leak detection tests and to require replacement of bare-steel pipelines;

4. Does the role of the Department of Natural Resources (DNR) need to be increased in the regulation of pipelines of all kinds; and

5. Do state and federal roles conflict in the area of pipeline regulation and safety.

The committee met three times for the purpose of listening to testimony. On March 14, 1989, the committee heard testimony from William D. Steinmeier, Chairman of the Missouri Public Service Commission. On March 22, 1989,

utility companies and municipal gas services were invited to appear before the committee, and on April 5, 1989, customers of regulated utilities and municipal gas systems were invited. This report contains an overview of the problem, testimony given, and a list of committee recommendations for immediate and future action.

Background

Since September of 1988, there have been 7 explosions in Missouri and 2 in Kansas directly related to natural gas leaks (Appendix A). Due to these explosions, there have been 21 injuries and 6 fatalities. Five of the explosions involved KPL Gas Service, three of the five occured in Missouri. The remainder involved Union Electric, City Utilities of Springfield, Fulton Municipal Gas System and Laclede Gas Company. All are under investigation except for the Union Electric explosion. A central theme in the investigations and media coverage of these tragic events has been the corrosion of bare-steel service lines. However, other factors include deterioration of cast iron mains, steel couplings, and corrosion of copper lines. In one incident, lightning damage to a plastic pipe was seemingly the cause of the explosion and in the Union Electric incident, deterioration of a cast iron main was identified as a factor leading to the explosion in Jefferson City.

Federal officials have openly criticized KPL for their lack of policy regarding replacement of bare-steel pipelines

and cast iron mains and contend that KPL's current policy is to "wait for failure." However, officials from the Office of Pipeline Safety recently told Representative Patrick Dougherty that they have only recently begun focusing more on inspection and leak detection of service lines. KPL now has a long range plan for replacement of customer owned bare-steel pipelines. The cost of replacement for Missouri lines is estimated to be $188 million.

Because many of the pipelines in question are 25 years old or older, concern has arisen regarding the frequency of leak detection surveys and the methods used for such surveys. Critics have voiced concern about the use of vegetation surveys for leak detection over more sophisticated methods. However, the PSC and utilities have responded by pointing out that vegetation surveys is an approved method where appropriate and that gas detectors and flame ionization tests are often used in conjunction with the vegetation surveys. Moreover, the utilities and municipal systems have been reluctant to take responsibility for monitoring and repair of customer service and yard lines due to questions of ownership and cost.

In response to the tragic events of the past and allegations of deficiencies by utilities and municipal gas systems, the PSC issued a emergency rule (Appendix B) requiring the immediate inspection of all unprotected steel lines. KPL recently reported that the survey within their system is complete and that all Class 1 and 2 leaks have

been repaired. In addition, the PSC is currently working on revisions to their rules and regulations which would address many of the concerns regarding pipe installation, protection, monitoring, safety requirements and pipe replacement.

Summary of Testimony

William D. Steinmeier, Chairman, PSC

Mr. Steinmeier testified that the Department of Transportation, Office of Pipeline Safety was seldom critical of the PSC and Missouri's safety record; however, due to the events of the recent past, these signs of support may have been overstated. In response to the tragic events of the past five months, the PSC intends to go beyond federal requirements in order to "reduce the risk" of future tragic events. In direct response to this events, the PSC has issued an emergency order, effective March 6, 1989, requiring all operators of corporation and municipal gas pipelines to immediately inspect all unprotected steel pipelines. KPL has recently completed their survey of 356,000 bare-steel pipelines in Missouri. The total number of leaks detected was 15,350 and of that total, 20 percent were Class 1 requiring immediate corrective action, 31 percent were Class 2 requiring repair within 15 days, 31 percent were Class 3 requiring repair within 5 years, and 18 percent were Class 4 which are considered non-hazardous (Appendix C). All Class 1 and 2 leaks have been repaired. Methods of repair include replacement of the defective pipe

or insertion of plastic pipe into the leaking section of steel pipe.

While much of the media focus has been on the bare-steel pipeline and the problem of corrosion, many of the leaks found have been due to deterioration of screw or coupling joints. In addition, the drought conditions of the past summer may have contributed significantly to the development of leaks. Soil movement and shrinkage due to the drought may have caused undo pressure on pipe joints and otherwise weakened lines.

Cathodic protection of steel pipelines greatly increases the pipe's resistance to corrosion; however, initiating this type of protection on existing bare-steel lines may cause more leaks to develop in areas of the pipe where corrosion has been active. Therefore, cathodic protection of new steel pipe is required but not practical for existing pipe.

Methods of leak detection required by the PSC and subsequently used by the various utilities also has been questioned by various parties. Since 1971. utilities have been responsible for inspecting gas service lines, pursuant to the federal Pipeline Safety Act. The PSC develops rules and regulations regarding leak detection methods based on federal requirements. The PSC has always favored the use of the best methods available. Vegetation surveys and instrumentation (gas detector, flame ionization) surveys are the two most commonly used methods. Vegetation surveys have been criticized; however, this type of survey meets federal

requirements. Moreover, vegetation surveys have seasonal limitations, are not very reliable in drought conditions and are best used in conjunction with other methods. Surveys using instrumentation are required every five years by federal law.

Corrosion tests are not reliable for leak detection but do give an indication as to the potential for leaks to develop. The federal government has never disputed the degree to which Missouri has chosen to use electric corrosion tests. Moreover, electric corrosion tests are not effective in detecting screw joint leaks, for leaks under pavement, or where multiple pipelines may run together. However, electrical corrosion tests are good for cross-country pipelines.

Other comments by Mr. Steinmeier in response to committee questions were:

1) Laws, rules and regulations had been strenuously enforced in the past; however, not now convinced that the PSC is doing enough.

2) If a unique condition condition arises, the PSC needs rulemaking authority to address that condition.

3) The PSC needs to have the same level of authority over municipal systems as they have over customer owned.

4) PSC would like to see a broadening of statutory authority over direct sale lines (e.g., farm taps) and master meter operations (e.g., housing developments).

5) PSC would like to to have additional gas safety personnel.

6) Currently, there are not any requirements that any pipeline must be replaced at some point in time.

7) PSC is also studying cast iron pipes; plastic pipe is state of the art.

8) Since the federal law was enacted in 1971, steel pipe must be cathodically protected. Pipe installed before that time was grandfathered.

9) It is not known whether the PSC can require the use of one type of pipe over another.

10) PSC is working on rules and regulations that would require that companies be responsible for leak detection survey and repair up to the customer's structure instead of terminating responsibility at the meter or property line.

Testimony by Utilities

1. KPL Gas Service, William E. Brown, Executive Vice President and Chief Operating Officer.

SEE PREPARED STATEMENT (Appendix D).

Comments in response to committee questions were:

1) The 7,000 leaks found by KPL in their recent leak survey would have been found irrespective of the tragedies of the past. The high number found was directly related to the intensive efforts of the survey.

2) PSC oversight of inspectors is adequate; Training program for accreditation is wanted.

3) Class 1 and 2 leaks have been repaired and KPL is beginning work on a systematic replacement of bare-steel pipelines.

4) KPL is studying ways to notify customers regarding their responsibilities over customer owned lines; however, KPL would prefer to take over responsibility of all customer owned lines.

5) Once a year inspectors go inside structures to check for leaks. Approximately 80,000 meters (of about 400,000) are located inside houses.

6) Warnings regarding gas leaks are issued with customer bills.

7) Leak inspection is not a general practice at times of new service start-up or restarting service.

8) Pipe installation is subject to local plumbing codes.

9) There is currently a 3 year rotation for leak detection on plastic pipes. There has been very little problem with plastic pipe.

10) KPL prefers annual leak surveys and ultimate replacement of bare-steel pipe.

11) KPL believes that there is a need for consistent interpretation of federal regulations overtime (e.g., when is electrical testing practical or not practical).

12) Some federal regulations applied to districts may not apply to some systems, or the rules are applied inconsistently.

2. Laclede Gas of St. Louis, Mr. Art Dorffi and Mr. Bill Spencer

Mr. Dorffi's testimony consisted of a response to the questions listed in the Speakers letter to the committee. His comments were:

1) Laclede was not aware of any problems with existing rules or lax enforcement.

2) Laclede does not have any yard lines.

3) Current regulations do not allow enough room for discretion by enforcement people.

4) Laclede is performing leak detection and is exceeding the standards in that area.

5) PSC has sufficient authority as evidenced by the emergency rule.

6) The Department of Natural Resources does not and should not have a role.

7) Laclede has a program in place to replace bare-steel pipelines within 12 years.

8) Leak checks are performed during service calls.

3. Union Electric, Mr Willaim J. Luebbert and Mr. Joe Birk

Mr. Luebbert stated that many factors are involved in a good company program including cathodic protection, gas oderization and public awareness. Department of Transportation rules and regulations are difficult to understand, insensitive to professional opinion, dogmatic and in need of definition.

4. Missouri Public Service, Larry W. Jones and Judy Ness

Mr. Jones stated that Missouri Public Service strictly follows the Department of Transportation, Office of Pipeline Safety rules and regulations.

5. Associated National Gas, Arkansas-Western Gas Company, Garland McTernan

Mr. McTernan stated that problems exist because of a lack of accepted standards for plumbing codes, installation and leak detection.

6. Missouri Association of Municipal Utilities, Paul Jensen

Mr. Jensen stated that there is a high level of concern among municipal utilities because customers and owners are one in the same. Enforcement seems to be adequate and PSC requirements and authority seem to be sufficient. Therefore, there is no need for legislation. Additional staffing could be supported by MAMU. The PSC lacks training guidelines; therefore, training on equipment comes from equipment suppliers.

7. City Utilities of Springfield, Gerald D. Toler

Mr. Toler stated that additional rules may not have prevented the accidents of the past. PSC has authority to increase performance standards by utilities but probably cannot order replacement of bare-steel pipe.

Public Testimony

1. Mr. Skip Chandler, Security Safe & Alarm Systems, Inc.

Mr. Chandler made the committee aware of a product known as a residential gas alarm which could be installed for the purpose of monitoring gas leaks within the home.

2. Mr. Jack W. Rodgers, Executive Director of Ecumenical Ministries of Fulton

SEE PREPARED STATEMENT (Appendix E).

Mr. Rodgers offered 4 recommendations in his testimony:

1) All bare-steel pipelines be replaced within a reasonable time;

2) All utilities and municipally operated systems take ownership and responsibility of all gas lines up to the point of sale;

3) Allow utilities and municipalities to draw on loan interest economic development loans for replacement of pipes; and

4) Allow utilities and municipalities to pass the cost of pipe replacement along to the user network over an extended period of time.

COMMITTEE RECOMMENDATIONS

Based on testimony given by the Missouri Public Service Commission, utilities and municipal gas systems and public comment, the Energy and Environment Committee believes that the PSC and the various gas service systems need to work together to restore citizen confidence in natural gas systems, and to lessen the risk associated with the use of natural gas to the greatest possible degree. The Missouri

House of Representatives' Standing Committee on Energy and Environment offers the following recommendations:

1. Eliminate the use of vegetation surveys as the sole means of leak detection;

2. Mandate the use of appropriate instrumentation (e.g., gas detectors or flame ionization tests) for leak detection surveys and use multiple methods when needed;

3. Require the development of training standards and periodic retraining for all inspection personnel with private or customer owned gas service systems;

4. Mandate inspections, monitoring and repair of service/yard lines by gas service systems up to the point of entry to a dwelling or structure;

5. If the PSC decides that the customer has some financial responsibility for repair of customer owned lines, the PSC shall establish guidelines for a time payment method;

6. Increase the inspection cycle of bare-steel pipelines and cast iron pipelines. For unprotected bare-steel pipe, inspections shall be once every year, all others shall be inspected every two years;

7. Require inspection for leaks or system failure at the time of service restart;

*8. Broaden PSC authority so orders, rules and regulations, except as they may pertain to rates, shall also apply to municipal gas systems;

*9. Give authority to PSC to temporarily waive notice and hearing requirements when emergency orders are needed to protect life or property;

*10 Broaden pipeline safety regulations to include direct sale and master meter inspections;

*11. Allow the PSC to obtain preliminary injunctions or temporary restraining orders for the purpose of enforcing emergency orders;

12. Enable the PSC to hire additional gas safety personnel;

13 Require gas service systems and other private entities to develop minimum uniform state codes on pipeline installation;

14. Encourage the development of safety and warning systems for service lines entering a private residence;

15. Require that customer owned lines meet national standards before service can be initiated;

16. Require all gas service systems, private or customer owned, to conduct a leak survey program and establish an organized replacement program for customer owned bare-steel service lines and yard lines.

* Will require action by the General Assembly.

Appendix A

Summary of Natural Gas Related Incidents

SUMMARY OF NATURAL GAS RELATED INCIDENTS
IN MISSOURI AND KANSAS
FROM SEPTEMBER 16, 1988 TO APRIL 5, 1989

Missouri

10/30/88- Explosion, Jefferson City, Missouri; Union Electric Company.
10 injuries; 1 building destroyed, 2 others damaged.
Missouri PSC Staff Report points to fractured cast iron main.

11/25/88- Explosion, Kansas City, Missouri; KPL Gas Service.
1 fatality, 5 injuries; 1 house severely damaged.
Under investigation, fracture in steel customer service line found at threaded coupling.

11/26/88- Explosion, Springfield, Missouri; City Utilities of Springfield.
2 minor injuries; 1 house severely damaged.
Under investigation, hole in plastic service line found, apparently caused by lightning.

12/5/88 - Fire, Kansas City, Missouri; KPL Gas Service.
1 vehicle destroyed, another damaged.
Under investigation, fracture in cast iron main found.

1/7/89 - Explosion, Fulton, Missouri; Fulton Municipal Gas System.
2 fatalities; 1 house destroyed, others damaged.
Under investigation, hole in steel customer service line found, apparently caused by corrosion.

2/10/89 - Explosion, Oak Grove, Missouri; KPL Gas Service.
2 fatalities; 1 house destroyed.
Under investigation, fracture in steel customer service line found at threaded coupling.

4/2/89 Explosion, St. Louis, Missouri; Laclede Gas Company.
No injuries; 1 house severely damaged.
Under investigation, holes in section of copper service line found, apparently caused by corrosion.

Kansas

9/16/88 - Explosion, Overland Park, Kansas; KPL Gas Service.
2 injuries; 1 house destroyed.
Under investigation, hole in steel service line found.

3/29/89 - Explosion, Topeka, Kansas; KPL Gas Service.
1 fatality, 2 injuries; 1 house destroyed.
Under investigation, fracture in cast iron main found.

Appendix B

Public Service Commission Emergency Rule

Missouri Public Service Commission

POST OFFICE BOX 360
JEFFERSON CITY, MISSOURI 65102
314 751-3234
314 751-1847 (Fax Number)

February 24, 1989

To All Operators of Gas Plants and Municipal Gas Systems

Dear Gentlemen:

Because of an unfortunate series of significant natural gas safety incidents in the last several months, the Public Service Commission is seriously concerned as to whether some combination of circumstances, including recent major drought conditions, may be having a significant and deleterious effect on the underground natural gas distribution systems in the state. In several of the recent incidents, steel service and yard lines which were not cathodically protected have been implicated.

In order to meet our responsibility for protecting the public safety, the Public Service Commission believes it imperative that leak surveys be performed with gas detection instruments within the next few months of all unprotected steel service and yard lines, in order to give an accurate assessment of where we are and accomplish immediately necessary repairs and replacements. To effect that program, the Commission has today issued an emergency rule, scheduled to become effective on March 6, 1989. I am attaching a copy of that rule for your study and use.

Although the emergency rule does not take legal effect until March 6, the Commission strongly urges you to implement it immediately. We will appreciate your full cooperation in the implementation of this important safety program.

Sincerely,

THE MISSOURI PUBLIC SERVICE COMMISSION

By William D. Steinmeier
Chairman

Title 4 - DEPARTMENT OF ECONOMIC DEVELOPMENT

Division 240 - Public Service Commission

Chapter 40 - Gas Utilities

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SECRETARY OF STATE

EMERGENCY RULE

4 CSR 240-40.055 - Gas Leaks in Unprotected Steel Service Lines

PURPOSE: This rule requires that all operators of gas corporations and municipal gas systems immediately inspect unprotected steel gas service lines.

EMERGENCY STATEMENT: From Nov. 21, 1988 to the date of this emergency filing, gas corporations and municipal gas distribution systems under the Commission's safety jurisdiction have reported five explosions and fires apparently attributable to gas leaks. Some of these explosions and fires have resulted in loss of life and serious injury; all have destroyed or damaged property. Preliminary investigative results indicate that bare steel service lines which have not been electrically (cathodically) protected against corrosion (unprotected bare steel service lines) have been involved in several of the incidents. The commission is concerned that coated steel service lines without cathodic protection may also pose a hazard. In addition, system-wide leak surveys conducted by KPL Gas Service on unprotected bare steel service lines have revealed a higher-than-anticipated incidence of leaks in such facilities. Such facilities are surveyed for leaks on a regular, periodic basis under current regulations. This increase in leaks and explosions was unforeseen, and has occurred in spite of the commission's ongoing program of enforcement of federal and state gas safety rules and regulations. That program has been consistently recognized as one of the best in the region and the nation by the U.S. Department of Transportation Office of Pipeline Safety. The recent increase in safety incidents may be attributable in part to ground subsidence caused by statewide drought, to a general deterioration of unprotected steel service lines, to factors unique to each incident, or to factors yet to be determined. Whatever the cause(s), the Public Service Commission has determined that an emergency exists regarding the condition of unprotected steel service lines, and that said lines constitute an immediate danger to the public health and safety, requiring this emergency rule for the expedited inspection of same. A copy of this emergency rule, together with the reasons therefor, has been mailed to each of the 46 operators of Missouri gas distribution systems. This affords the operators an opportunity to present their views to the commission prior to the effective date of this emergency rule. The commission believes that the nature of this emergency, as stated above, together with the increased use of gas for winter residential heating justifies the suspension of notice and publication requirements.

(1) Subject to section (4), on or before April 15, 1989, all gas corporations and municipal gas systems shall conduct a flame ionization leak survey of all customer-owned unprotected steel service lines in each operator's service area. An equivalent gas detection survey instrument may be used in lieu of, or in addition to, a flame ionization instrument. On or before April 30, 1989, all operators shall submit to the commission a summary report showing the results of the leak survey, including at minimum: (a) number of lines surveyed; (b) number of leaks found by classification and identified by location, either upstream or downstream of the meter; and (c) disposition of leak(s).

(2) Subject to section (4), on or before July 1, 1989, all gas corporations and municipal gas systems shall conduct a flame ionization leak survey of all other unprotected steel service lines in each operator's service area. An equivalent gas detection survey instrument may be used in lieu of, or in addition to, a flame ionization instrument. On or before July 15, 1989, all operators shall submit to the commission a summary report showing results of the leak survey, including at minimum: (a) number of lines surveyed; (b) number of leaks found by classification; and (c) disposition of leak(s).

(3) For purposes of this emergency rule, "service line" means the pipeline connected to the operator's distribution main and running from the main to the wall of the customer's building, irrespective of the location of the meter set.

(4) Unprotected steel gas service lines tested for leaks by flame ionization or an equivalent gas detection instrument on or after Oct. 1, 1988, need not be retested under this emergency rule.

(5) All leaks found upstream of the meter during the leak survey shall be handled consistent with 4 CSR 240-40.050. Leaks found downstream of the meter shall be classified in accordance with 4 CSR 240-40.050 and repaired or replaced according to operator tariffs or policies.

(6) A variance from the provisions of this emergency rule may be granted upon good cause shown.

Auth: 386.250(5), RSMo 1986, 393.140, RSMo 1986, 386.310 (1)(4), RSMo 1986. Emergency rule filed Feb. 24, 1989, effective March 6, 1989, expires July 1, 1989.

Appendix C

Gas Leak Classifications
Meter Installation Diagram
Gas Safety Testing Overview

GAS LEAK CLASSIFICATIONS

CLASS 1

A gas leak which due to its location and/or magnitude constitutes an immediate hazard to a building and/or the general public. It shall require immediate corrective action which shall provide for public safety and protect property.

Examples: A gas fire, flash or explosion; broken gas facilities such as contractor damage, main failures, or blowing gas in a populated area; an indication of gas present in a building emanating from company-owned facilities; gas reading equal to or above Lower Explosive Limit in a tunnel, sanitary sewer, or confined area; gas entering a building or in imminent danger of doing so; and, any leak which, in the judgment of the supervisor at the scene, is regarded as immediately hazardous to the public and/or property.

CLASS 2

A gas leak that does not constitute an immediate hazard to a building or to the general public, but is of a nature requiring action as soon as possible. A leak of this classification shall be repaired or properly reclassified to a lower leak classification within fifteen (15) days after the initial investigation unless it is definitely included and scheduled in a rehabilitation or replacement program to be completed within a period of one (1) year, in which case, the leak must be rechecked every fifteen (15) days to determine that no immediate hazard exists.

Examples: A leak from a transmission line discernible twenty-five (25) or more feet from the line and within one hundred (100) feet of a building; any reading outside building at foundation or within five (5) feet of foundation; any reading greater than fifty percent (50%) gas-in-air located five (5) to fifteen (15) feet from building; and reading below the Lower Explosive Limit in a tunnel, sanitary sewer, or confined area; any reading equal to the Lower Explosive Limit, or greater, in a vault, catch basin or manhole other than a sanitary sewer; or, any leak, other than a Class 1, which in the judgement of the supervisor at the scene, is regarded as requiring Class 2 priority.

CLASS 3

A leak that does not constitute a hazard to property or to the general public but is of a nature requiring routine action. These leaks must be repaired within five (5) years and be rechecked every six (6) months until repaired or the facility is replaced.

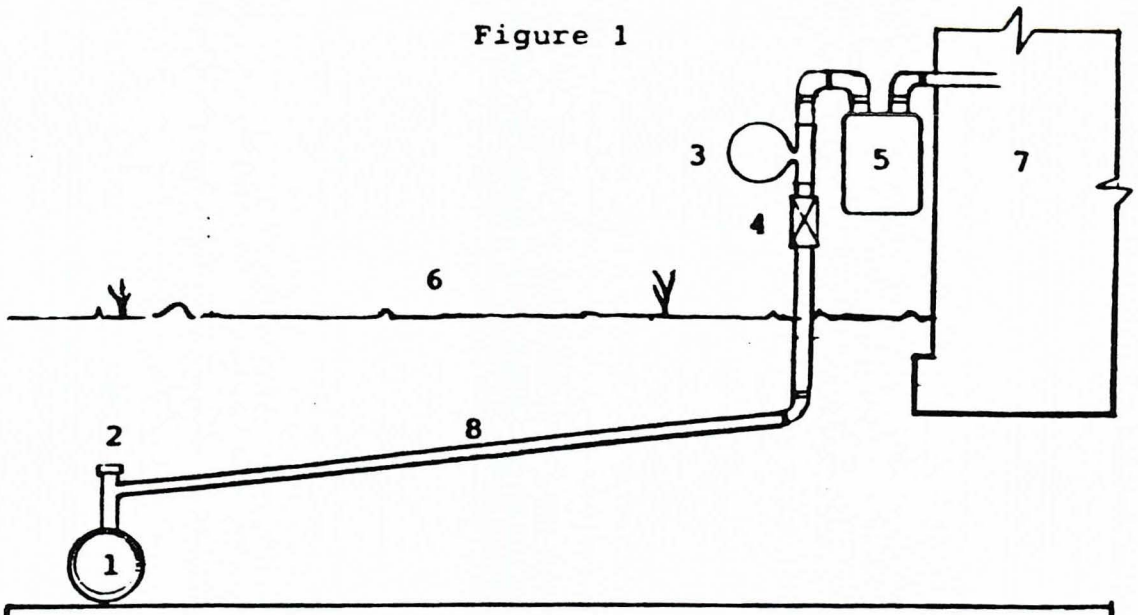
Examples: Any reading of fifty percent (50%), or less, gas-in-air located between five (5) and fifteen (15) feet from a building; any reading between fifteen (15) and fifty (50) feet from a building except those defined in Class 4; a reading less than the Lower Explosive Limit in a vault, catch basin, or manhole other than a sanitary sewer; or any leak, other than a Class 1 or Class 2 which in the judgment of the supervisor at the scene, is regarded as requiring Class 3 priority.

CLASS 4

A confined or localized leak which is completely nonhazardous. No further action is required.

TYPICAL METER INSTALLATIONS

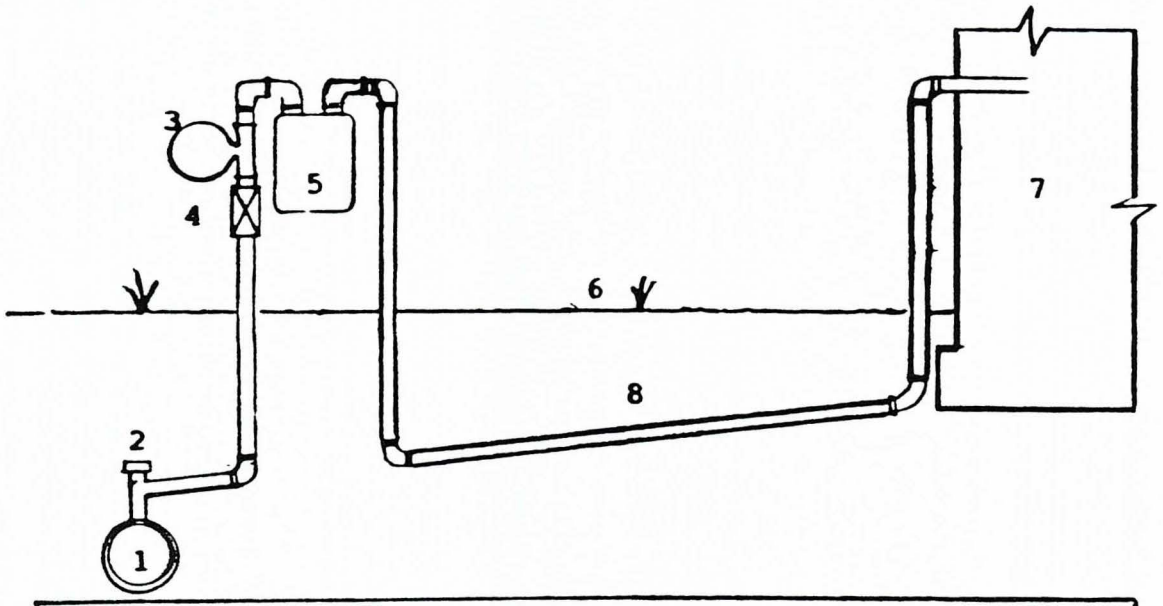
Figure 1



METER SET LOCATED AT HOUSE

1. Gas Main	5. Meter
2. Service Tap	6. Grade
3. Pressure Regulator	7. House
4. Shut-off Valve	8. Service Line

Figure 2



METER SET LOCATED AT PROPERTY LINE

1. Gas Main	5. Meter
2. Service Tap	6. Grade
3. Pressure Regulator	7. House
4. Shut-off Valve	8. "Yard" Line

GAS SAFETY TESTING

LEAK TESTS

PURPOSE:

To detect the escape of natural gas from piping and the migration boundaries of the natural gas.

APPROVED TESTS

Business Area Survey:
- Gas Detector

Residential Survey:
- Gas Detector
- Bar Test Surveys
- Vegetation Surveys
- Pressure Drop Surveys

CORROSION TESTS

PURPOSE:

To monitor the adequacy of cathodic protection where it exists, and where not, to find locations which may be subject to corrosive action.

APPROVED TESTS

(Electrical Survey Methods)

Monitoring of Protected Steel:
- Potential Survey

Evaluation of Unprotected Steel:
- Over-the-Line Potential Survey
- Line Current Survey
- Supplemental Test:
  - Soil Resistivity

Appendix D

Testimony by William E. Brown
KPL Gas Service

KPL GAS SERVICE

Testimony Before

MISSOURI HOUSE ENERGY & ENVIRONMENT COMMITTEE

By

William E. Brown, Executive Vice President,

and Chief Operating Officer

March 22, 1989

Good evening. Mr. Chairman and members of the Committee, I want to thank you for this opportunity to meet with you and to discuss the recent natural gas accidents, what we are currently doing about them, and future programs we will be pursuing to assure the safety of the KPL Gas Service distribution system.

A question being asked is: "Why did the accidents occur?"

"Accidents" is the key word. We believe that each of the incidents involving significant property damage, serious injury or fatalities with customers of KPL Gas Service, were accidents that may not have been prevented by any action of our Company.

To date, the two accidents at Kansas City area homes and the one that burned a car on KPL Gas Service lines remain under investigation by the National Transportation Safety Board and the Missouri Public Service Commission. The NTSB findings aren't expected until later this year.

-more-

Lacking complete information, the news media have engaged in a lot of speculation. Many reports have implied that leaks found in the pipes serving the homes involved were caused by corrosion. All three homes were served by customer-owned bare (unprotected) steel gas service lines, which can be susceptible to corrosion. However, the preliminary test results released by NTSB have pinpointed corrosion as the cause of leaks. Preliminary findings indicate that there may have been a variety of reasons for the accidents, not simply corrosion.

A contributing factor to the recent accidents may be the drought that has plagued the region for more than a year. Lack of moisture causes the ground to compact and shift and put stress on underground pipe. In fact, many cities in the region have experienced increases in water line breaks since last summer.

At KPL Gas Service we grew concerned last August that the risk of gas line leaks could increase as the drought persisted. Consequently, gas safety advertising was expanded. Through newspaper ads and radio commercials, customers were urged to call KPL Gas Service if they smelled gas around their homes. Ironically, the expanded schedule of ads began September 16th, the same day the explosion occurred in Overland Park, Kansas.

We've also been asked: "Could the recent accidents on the KPL Gas Service gas system have been prevented?"

The obvious answer is, "Yes." If the families had been aware of the gas leaks and left their homes in time...or, if they had called us in time.

Since the accidents, much attention has focused on the issue of electrical testing for corrosion on unprotected steel lines, specifically service lines and yard lines installed by others and owned by the customer.

Prior to 1971, many gas companies, including KPL and its predecessor, The Gas Service Company, ran the gas main and provided the meter and meter setting for individual customers. The customer provided the service line or yard line to connect with the main distribution line. Those lines were installed by homebuilders or by others.

Last week, Chairman Steinmeier of the Public Service Commission discussed the difference between service lines and yard lines -- the principal difference being the location of the meter. We've attached a sketch at the back of our material illustrating the two types of lines.

KPL Gas Service has historically relied upon four methods for detecting leaks in such customer owned lines, as well as company-owned service lines: 1) Mobile flame-ionization tests conducted along our mains every three years; 2) Meter readers, on their
monthly routes, report gas odor or other indicators of gas leaks in the vicinity of gas lines; 3) Annual vegetation or other surveys arranged to cover a part of the system each year

so the entire system is covered in accordance with the regulations; and 4) Reports from customers who smell the distinctive odorant added to natural gas as a safety precaution.

For many years customers have been urged by the Company -- through a wide range of media advertisements, educational programs and notices printed on their bills -- to call if they smell gas. In 1987 and 1988 both media advertising and notices on monthly bills were increased, urging customers to call us anytime they smell gas. In Missouri, beginning in December 1987, an additional message has been printed on the front of the bill - "If you smell gas, call us!" And, our customer advisors have conducted hundreds of programs on safety in schools, with senior citizen groups, meetings with social agencies and others. Over the past several years thousands of customers have received these messages.

Our leak detection measures have always complied with, and often exceeded, state and federal pipeline safety requirements. As part of our safety inspection program, we check public buildings and schools each year, inside and outside the buildings. In commercial areas, such as downtown business districts where there is wall-to-wall pavement, we check for leaks with flame ionization equipment every 90 days.

For more than 20 years, mobile leak survey units have been used to cover our entire service area checking company-owned

mains with flame-ionization units at least once every three years, although federal regulations require such inspections only once every five years.

We have not conducted electrical tests for corrosion on service lines or yard lines. While it has been suggested that tests have been rejected by KPL because of the expense, the fact is electrical tests do not detect leaks, and inspections for leaks must be conducted before and after electrical tests.

Electrical inspections to determine corrosion potential are called for by federal standards on bare steel (unprotected) piping, and we do conduct them on cross-country transmission pipeline and certain of our distribution mains. But, those same regulations also say such tests are <u>not</u> required where they are <u>impractical</u> (such as under pavement, under railroad tracks, or near other underground conduits).

KPL Gas Service considers electrical testing of residential service or yard lines impractical because any buried material capable of corroding can invalidate test results. Sewer or water pipes close to gas lines in yards, leftover building materials in the ground or reinforcing rods in nearby concrete can throw the tests off. If these tests are made under such conditions, they will indicate corrosion even where none exists.

For years, this position has been conveyed to state regulators who enforce federal pipeline safety standards, and the Missouri Public Service Commision staff has shared our opinion. It is very important for you to understand that electrical surveys do not detect leaks; only conditions that are conducive to corrosion.

The extensive leak inspections we've just completed in Missouri show only if a leak did or did not exist on the day of the inspection. If there is a subsequent leak or break, the only way to know about it is for the customer to call and tell us they smell gas.

There is no assurance any of the tragic recent accidents could have been prevented by more timely flame ionization, vegetation survey or electrical tests. Customers must be the ultimate leak detectors by letting us know quickly if they smell gas. Even though a service or yard line has been checked and found to be safe, a leak may develop in the future. There always is the possibility that a shift in the ground or some other occurrence can cause a leak the very next day.

Gas odorant was reportedly detected by customers at three of the sites within 24 hours prior to the recent accidents. Tragically, none of these detections were reported to the Company.

It was only after the accidents occurred that people were quoted in news stories as saying they had been smelling gas prior to the accidents.

Another question is: "What is the Company doing to reassure customers about gas line safety?"

We have just completed an unprecedented leak inspection program, checking lines in customer yards from the main to the foundation of the house. In recognition of the public concern over the past few months, we have undertaken the task to inspect and to repair these lines, whenever necessary.

While federal regulations require leak inspections to be completed every five years, KPL Gas Service has completed inspections of all customer-owned bare steel service lines and yard lines in Missouri this month -- in less than six months from the date the program was begun -- last October. We have inspected a total of more than 650,000 bare steel service and yard lines in Missouri, Kansas, Oklahoma and Nebraska.

According to some recent news stories and editorials, there is a misconception among some people that KPL bought an old leaky gas system from The Gas Service Company five years ago, and then did nothing to the lines until the current problems occurred. This is not true. KPL bought a good, well-built and

well-maintained distribution system from Gas Service. But, the bare steel service lines that have been the subject of our recent accelerated leak detection survey are owned and were installed by customers or their contractors. They have never been the property of KPL or its predecessor, The Gas Service Company. Therefore, we did not buy them or take them over when KPL purchased The Gas Service Company in 1983.

But, in the interest of public safety, KPL Gas Service has made an enormous commitment of manpower, equipment, materials and dollars to our customers. To eliminate the public confusion over who owns the line, and who has responsibility to find and fix leaks, KPL Gas Service has said: "We'll do it all...we'll do it now, and we'll worry about the costs later."

Here are some of the unprecedented actions we have taken since October to solve a problem that was not of our own making:

- KPL Gas Service has taken responsibility for inspection, replacement or repair of customer-owned bare-steel service and yard lines.
- Flame-ionization devices, the most sophisticated leak detection equipment available, have been used by inspectors walking from the main to the foundation of each home to test for leaks.
- KPL Gas Service leak survey crews have responded to the home of any customer who requested an inspection even if bare steel pipe was not involved.

• All leaks posing an immediate hazard have been fixed.

• The target date for completing leak surveys of all customer-owned bare steel service lines in Missouri was accelerated from the originally planned target date of summer 1989 to actual completion on March 15.

• Additional flame ionization equipment was purchased and additional employees of the Company were trained to use it.

• All available outside contractor leak survey personnel were recruited from the two national firms that offer such service and brought in to help complete the survey of our service area.

• In December, we began attaching green tags on meters to notify customers that their lines had been checked.

• Weekly ads in the Kansas City Times/Star listed areas in the Kansas City area to be surveyed in each coming week.

• In early February, approximately 150 Company and outside leak inspectors and service crew personnel were moved from Kansas to Missouri so we could finish all inspections by mid-March.

• Inspectors continued working 10-hour shifts, seven days a week; while some repair crews are working even longer hours, until all customer-owned lines had been inspected and hazardous leaks found had been repaired.

• These actions are all in addition to the $25 million we have spent on our Missouri gas system in the past two years in ongoing maintenance and replacement of mains and service lines.

• Discussions continue with regulators in Kansas and Missouri about ways to assure we have the safest possible gas distribution system. Both states are in the process of establishing new rules and tougher pipeline safety standards governing future maintenance and replacement of bare-steel lines.

When the accelerated pipeline inspections are completed, what comes next?

We have submitted an ongoing plan for inspection and replacement of the troublesome unprotected steel pipe. It includes:

• Annual inspection using flame ionization devices.

• Division of the Company's service area into sectors defined as areas with common characteristics. When the number of leak-related replacements in a sector equals 25 percent of all unprotected steel service lines in the sector as of January 1, 1971, the remaining unprotected bare steel pipe in the sector will be replaced in an accelerated program over not more than 18 months.

• If total replacements in a year, including accelerated program replacements, are less than five percent of the unprotected bare steel service lines remaining as of July 1, 1989, we will replace additional lines to total five percent.

facilities from needless damage and help protect workers from injury resulting from contact with such facilities. Across our four-state system, there are dozens of cases each week where people accidentally dig into our lines, or customers' service lines because they don't know they are there. We believe having one place to call for location of all underground lines, making it mandatory for all utilities to participate in such a program, and providing penalties for those who dig without first calling, would be beneficial.

I thank you for the opportunity to appear before your committee, and now I'll try to answer any questions you have.

Appendix E

Testimony by Jack W. Rodgers
Ecumenical Ministries of Fulton

JACK W. ROGERS

I would like to thank you for giving me the opportunity to address this committee this evening. I am the Executive Director of Ecumenical Ministries in Fulton. This is an organization of over 2,000 people in Callaway County from ten churches from six denominations. We coordinate volunteer services for nearly 20 different projects including hospice services and a variety of programs aimed at senior citizens and low income families.

Many of these elderly and low income persons do own homes. Many of these homes are older homes, built when these elderly were still in the workforce. Those low income persons who may have been able to afford a home are often living in older homes whose prices have declined over the years. Many of these homes have been found to have gas lines that are made of uncoated steel and either leaking or subject to leaking. It was just such a leak that resulted in so terrible an explosion just a few months ago in Fulton. An adult and a small child were trapped in the collapsed and burning house. Neighbors reported hearing their screams for some time, but rescue was not possible. They died.

This and several other such tragedies around Missouri have prompted this committee to meet and the Public Service Commission to require testing and locating these old lines. But in certain areas such as Fulton, these leaks when found only cause more misery. Fulton, like several utilities in the state, refuses to accept responsibility for gas lines after they cross the owner's property lines. They are requiring the owners to repair the leaks, immediately if a major leak exists and within 15 days if a minor one is found.

In Fulton, slightly over 1,100 inspections have been made. About 170 leaks were found. This would indicate that over 10% of the houses inspected now have leaking pipes. An average pipe replacement in Fulton costs about $200. One company contacted stated that replacement can be as low as $100, but a replacement can go as high as $1,200.

Many homeowners are able to pay such a bill without a great deal of difficulty, but there are many homeowners who will find this too heavy a cost to bear. The elderly are on a fixed income. The average social security income is about $500 per month for a single family household and $750 for a two family income. In Callaway County, there are 5,186 seniors or 16% of the county's population. These seniors have an average of $7,000 a year less income than the county's median income.

Agreed, not all of these live in Fulton and have gas lines that need replacement, but many do. According to the last available statistics, seniors in this area are between 5% and 40% below the OMB poverty guidelines. The older the person, the farther below they tend to be. This is true across the board and fairly constant for all our Missouri communities.

From their meager incomes they must pay for other utility costs, medical needs and medicines that often cost over $200 per month, food and taxes. Many of these elderly already are faced with staying warm, staying healthy or eating regular meals. These people cannot afford several hundred dollars to replace pipes within 15 days, or worse before the gas can be turned back on. They certainly cannot afford to replace lines that currently are not leaking but may soon be.

This is an important issue. The health and safety of Missourians is at stake. Indeed a number have already died. We cannot wait for more to die. Yet it is unfair to burden the homeowner with what is the responsibility of the utility. It is doubly unfair to those who may have to spend as much as 1/4 of their monthly or even their yearly income to keep their property safe. Please act now.

Thank you.